UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Larry I Golden	PEREZ DAPLE, AARON C
Square D Company	

ART UNIT	PAPER NUMBER
2121	

Larry I Golden
Square D Company
1415 South Roselle Road
Palatine, IL 60067

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 09/707,604	**Applicant(s)** HWU ET AL.
	Examiner Aaron C Perez-Daple	**Art Unit** 2121	

-- Th MAILING DATE of this communication appears on the cover she t with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 November 2000_ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

       1.☐ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____ .

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)   4)☐ Interview Summary (PTO-413) Paper No(s). _____ .

2)☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5)☐ Notice of Informal Patent Application (PTO-152)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .   6)☐ Other: .

DETAILED ACTION

Drawings

1.   Figure 1 should be designated by a legend such as --Prior Art-- because only that which is

old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected

drawings are required in reply to the Office action to avoid abandonment of the application.

The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making
> and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it
> pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode
> contemplated by the inventor of carrying out his invention.

3.   **Claims 7, 14 and 18** are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the enablement requirement. The claim(s) contains subject matter which was

not described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, while the specification states on page 4, lines 12-13 that "any combination of IP

and MAC addresses of the controllers can be exchanged," the specification is not enabling

for the exchange of MAC addresses because no specific method is presented for the

exchange. Therefore, one of ordinary skill in the art would not be enabled to make and/or

use the invention.

4.   **Claim 19** is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the

written description requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the

claimed invention. Specifically, the specification does not disclose the step of aborting all

connections to the first and second.controllers.

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

6.   **Claim 20** is rejected under 35 U.S.C. second paragraph for reciting the limitation "the

processor, co-processor, operating system and co-operating system" in lines 1-2. There is

insufficient antecedent basis for this limitation in the claim. For the purposes of applying

prior art, the Office interprets this limitation as, "a processor, co-processor, operating system

and co-operating system."

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

8.   **Claims 1, 2, 4, 5, 8, 9 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable

over applicant's admitted prior art (specification, pg. 5, line 25 – pg. 7, line 14, "Controllers

have been...the secondary controller.") (hereinafter AAPA) in view of Pardillos et al (US

5,367,646) (hereinafter Pardillos).

9.   As for claim 1 and 9, AAPA teaches an active standby system and method for a control

system, the active standby system comprising:

a first and second controller, each controller having an operating state [controllers 12,

Fig. 1]; and

a high speed fiber optic network cable operably connecting the first and second

controllers for transferring data between the controllers [serial link 17, Fig. 1].

AAPA teaches the transfer of data between the controllers at either a low-speed or high-

speed [pg. 6, lines 23-24, "The serial link…or high-speed."], however AAPA does not

specifically teach transferring data between the controllers at a rate of at least 100 Mb/s.

Pardillos teaches transferring data on a controller network at a rate of at least 100 Mb/s [col.

1, lines 41-45, "One of the numerous…100 megabits per second."].

It would have been obvious to one of ordinary skill in the art at the time of the invention

to modify AAPA by transferring data between the controllers at a rate of at least 100 Mb/s,

because this would allow for faster transmission and response over the network, as taught by

Pardillos [col. 1, lines 41-45, "One of the numerous…100 megabits per second."].

10.   As for claim 2, AAPA discloses the active standby system of claim 1 and the method of

claim 9 wherein each controller comprises:

a processor [CPU 26, Fig. 1];

a co-processor [hot standby module 20, Fig. 1];

an operating system executed by the processor [inherent]; and,

a co-operating system executed by the co-processor [inherent] wherein the operating

system and the co-operating system cooperate to transfer data between the first and second

controllers [col. 7, lines 7-14, "Communication between the…the secondary controller."].

11.   As for claim 4, AAPA discloses the active standby system of claim 3 wherein each

controller further comprises a remote IO head [remote IO heads 18, Fig. 1] and reach remote

IO head is operably connected together and to a remote IO drop [remote IO drops 24, Fig. 1].

12.   As for claim 5, AAPA discloses the active standby system of claim 4 further comprising

at least one processor device operably connected to the first and second controllers

[processor unit 19, Fig. 1].

13.   As for claim 8, AAPA discloses the active standby system of claim 1 wherein each

controller is operably connected to a processor unit [processor unit 19, Fig. 1].

14.   As for claim 12, AAPA does not specifically disclose that the network may be an

Ethernet network. Pardillos discloses the use of an Ethernet network for a control system

[col. 10, lines 42-48, "Each of these zones…such as FDDI."]. It would have been obvious to

one of ordinary skill in the art at the time of the invention to modify AAPA by using an

Ethernet network in order to have a protocol for the transfer of data over the high-speed

network, as taught by Pardillos [col. 10, lines 42-48, "Each of these zones…such as FDDI."].

15.   **Claims 3, 6, 7, 10, 11, 13, and 14** are rejected under 35 U.S.C. 103(a) as being

unpatentable over AAPA in view of Pardillos and in further view of Yamamoto (US

6,049,825).

16.   As for claims 3 and 10, neither AAPA nor Pardillos specifically disclose determining the

network identifier of each controller from the operating state of each respective controller.

However, Yamamoto discloses a method for switching between duplicated elements of a

network which, as one of ordinary skill in the art would recognize, may be used to switch

between the primary and secondary controllers in the network disclosed by AAPA [col. 5,

lines 47-65, "To accomplish the above...network interface layer."]. Yamamoto further

discloses determining the network identifier of each element by the operating state of each

respective element [col. 5, lines 16-24, "To accomplish the above...has been detected."]. It

would have been obvious to one of ordinary skill in the art at the time of the invention to

modify the teachings of AAPA and Pardillos by determining the network identifier of each

controller from the operating state of each respective controller, because this would allow

automatically switching between the primary and secondary controllers with a quick

recovery time after a failure, as taught by Yamamoto [col. 5, lines 9-14, "Taking the

above...the TCP/IP protocol."].

17.   As for claims 6 and 13, neither AAPA nor Pardillos disclose an active standby system of

claims 3 and 10 wherein the network identifier is an Internet Protocol address. Yamamoto

discloses an active standby system wherein the network identifier is an Internet Protocol

address [col. 5, lines 47-65, "To accomplish the above...network interface layer."]. It would

have been obvious to one of ordinary skill in the art at the time of the invention to modify

AAPA and Pardillos by using an Internet Protocol address as the network identifier, because

this would allow automatically switching between the primary and secondary controllers

with a quick recovery time, as taught by Yamamoto [col. 5, lines 9-14, "Taking the

above...the TCP/IP protocol."].

18.   As for claims 7 and 14, neither AAPA, Pardillos nor Yamamoto specifically disclose an

active standby system of claims 3 and 10 wherein the network identifier is a Media Access

Control (MAC) address. However, Yamamoto does disclose a method wherein a network

adapter has both an IP and a MAC address, and wherein the IP address is determined by the

operating state of its respective adapter [col. 5, lines 47-65, "To accomplish the

above...network interface layer."]. It would have been obvious to one of ordinary skill in the

art at the time of the invention that the teachings of Flood, Pardillos and Yamamoto could be

modified by determining the MAC address, rather than the IP address, from the operating

state of the respective controller in order to achieve the objective of switching the primary

and secondary controllers.

19.   As for claim 11, AAPA discloses a method similar to claim 10 wherein each controller

comprises:

     a processor [CPU 26, Fig. 1];

     a co-processor [hot standby module 20, Fig. 1];

     an operating system executed by the processor [inherent]; and,

     a co-operating system executed by the co-processor [inherent] wherein the operating

system and the co-operating system cooperate to transfer data between the first and second

controllers via the fiber optic cable [col. 7, lines 7-14, "Communication between the...the

secondary controller."].

20.   **Claims 15-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Flood (US

5,997,166) in view of Pardillos and in further view of Yamamoto (US 6,049,825).

     As for claim 15, Flood teaches a method for providing an active standby control system

comprising a first and second controller, each controller having an operating state, the

method comprising the steps of:

forming a network by operably connecting the first and second controllers with a cable

for transmitting data between the controllers [col. 4, lines 5-8, "Included among the...high-

speed link 24."; Fig. 1];

placing one controller in a primary state and the other controller in a secondary state [col.

1, lines 25-33, "Industrial controllers must...with minimal interruption."];

assigning a network identifier to designate each controller [inherent for communication

on the network];

sensing the operating state of the primary mode controller [col. 2, lines 3-10,

"Accordingly, the present invention...its functional modules."; col. 8, lines 49-53, "Upon the

occurrence...the primary chassis."].

Although Flood discloses transmitting data between the controllers over a high-speed

data link [col. 4, lines 5-8, "Included among the...high-speed link 24."], Flood does not

specifically disclose transmitting data between the controllers over a fiber optic cable at a

rate of at least 100 Mb/s. Pardillos teaches transferring data over a controller network via a

fiber optic cable at a rate of at least 100 Mb/s [col. 1, lines 41-45, "One of the

numerous...100 megabits per second."]. It would have been obvious to one of ordinary skill

in the art at the time of the invention to modify Flood by transmitting data between the

controllers over a fiber optic cable at a rate of at least 100 Mb/s, because this would allow for

faster transmission and response over the network, as taught by Pardillos [col. 1, lines 41-45,

"One of the numerous...100 megabits per second."].

Although Flood discloses switching the primary and secondary controllers on the

network [col. 8, lines 49-53, "Upon the occurrence...the primary chassis."], Flood does not

specifically disclose a method for accomplishing this switch. Furthermore, Flood does not disclose transmitting a reverse address resolution protocol (RARP) message on the network, wherein the newly designated primary controller resumes network operations. Yamamoto discloses a method for switching between duplicated elements of a network which, as one of ordinary skill in the art would recognize, may be used to switch between the primary and secondary controllers in the network disclosed by Flood. Specifically, Yamamoto discloses swapping the network identifiers between the first and second duplicated elements by sending an ARP message over a layered network [col. 5, lines 47-65, "To accomplish the above…network interface layer."]. Furthermore, Yamamoto discloses that an RARP message may be used in the reverse manner of an ARP request in order for a device to identify its IP address on the network [col. 6, line 61 – col. 7, line 5, "In the network interface…Resolution Protocol (RARP)."].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Flood and Pardillos with the teachings of Yamamoto by swapping the network identifiers between the first and second controllers, because this would enable automatically switching between the primary and secondary controllers with a quick recovery time after a failure, as taught by Yamamoto [col. 5, lines 9-14, "Taking the above…the TCP/IP protocol."]. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Flood and Pardillos with the teachings of Yamamoto by transmitting a reverse address resolution protocol (RARP) message on the network, wherein the newly designated primary controller resumes network operations, because this would allow the newly designated primary controller to ascertain its

IP address before transmitting commands, as taught by Yamamoto [col. 6, line 61 – col. 7, line 5, "In the network interface...Resolution Protocol (RARP)."].

21.   As for claim 16, neither Flood nor Yamamoto specifically disclose the method of claim 16 wherein the network is an Ethernet network. Pardillos discloses the use of a controller network which comprises an Ethernet network [col. 10, lines 44-46, "These frames may...or other protocols."]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Flood and Yamamoto by using an Ethernet network, as taught by Pardillos, because Ethernet is one of the common networking protocols which enables high-speed communications between devices on a network.

22.   As for claim 17, neither Flood nor Pardillos specifically disclose the method of claim 18 wherein the network identifier is an Internet Protocol address. Yamamoto discloses a method for swapping network identifiers wherein the network identifier is an Internet Protocol address [col. 5, lines 47-65, "To accomplish the above...network interface layer."]. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Flood and Pardillos by using an Internet Protocol address as the network identifier, because this would allow automatically switching between the primary and secondary controllers with a quick recovery time, as taught by Yamamoto [col. 5, lines 9-14, "Taking the above...the TCP/IP protocol."].

23.   As for claim 18, neither Flood, Pardillos nor Yamamoto specifically disclose the method of claim 18 wherein the network identifier is a Media Access Control (MAC) address. However, Yamamoto does disclose a method wherein a network adapter has both an IP and a MAC address, and wherein the IP address associated with the MAC address is switched,

thereby switching the IP address of the network adapter [col. 5, lines 47-65, "To accomplish

the above...network interface layer."]. It would have been obvious to one of ordinary skill in

the art at the time of the invention that the teachings of Flood, Pardillos and Yamamoto could

be modified by swapping the MAC addresses rather than the IP addresses in order to achieve

the objective of switching the primary and secondary controllers.

24.   As for claim 19, neither Flood, Pardillos nor Yamamoto specifically disclose aborting all

connections to the first and second controllers. It would have been obvious to one of

ordinary skill in the art at the time of the invention to modify Flood, Pardillos and Yamamoto

by aborting all connections to the first and second controllers, because this would allow for

an emergency shutdown of the system or resetting of the system.

25.   **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Flood in view of

Pardillos in further view of Yamamoto and in further view of Chevallier (US 6,584,019).

Neither Flood, Pardillos nor Yamamoto specifically disclose a processor nor an operating

system embedded in Flash RAM. However, Chevallier discloses a processor and operating

system embedded in Flash RAM [col. 9, lines 11-33, "An integrated circuit...are

embedded."]. It would have been obvious to one of ordinary skill in the art at the time of the

invention to modify the teachings of Flood, Pardillos and Yamamoto by embedding the

processor, co-processor, operating system and co-operating system in Flash RAM, because

this would allow for the use of a single integrated circuit chip, as taught by Chevallier [col. 9,

lines 11-33, "An integrated circuit...are embedded."].

Conclusion

26.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. US 5,912,814, note Fig. 1; US 5,966,304, note Fig. 1; US 5,777,874, note Fig. 2;

US 5,313,386, note Fig. 1; US 4,958,270, note redundant processor system; US 4,872,106,

note back-up processor in industrial control system; US 5,832,228, note teaches RARP, ARP

over a network; US 5,008,805, note Fig. 1; US 6,097,882, note Fig. 1; US 6,615,324, note

embedded Flash memory; US 5,526,489, teaches RARP; US 6,542,510, teaches RARP.

27.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Aaron C Perez-Daple whose telephone number is (703)305-

4897. The examiner can normally be reached on 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Anil Khatri can be reached on (703)305-0282. The fax phone number for the

organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703-305-4700.

9/25/03

Aaron Perez-Daple

RAMESH PATEL
PRIMARY EXAMINER   10/6/03

For Anil Khatri